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several factors in one region of a chromosome have been discovered. NILSSON-EHLE[12] now claims to have such a case, and calls it "complexmutation." Normal wheat mutates to bearded speltoid, involving a simultaneous change in two closely linked factors. Among the F_2 progeny of normal × mutant appear a few bearded normal type and beardless speltoid, but only a very few, due to the very close linkage of the two mutated factors. In another case the investigator claims that three linked factors have mutated simultaneously.—M. C. COULTER.

Ozark forests.—The Ozark region, as covered by PALMER[13] in this reconnoissance, is defined as occupying the southern half of Missouri, a narrow spur crossing southern Illinois, the northwestern part of Arkansas, and a long triangular strip in eastern Oklahoma. The two topographic divisions of this uplifted region, lying midway between the higher mountains of the east and west, are the flat-topped dome of the northern plateau with an average altitude of 300–500 m., and the southern Boston Mountains with a few points above 600 m. It is a hill region surrounded by fertile plains, and possessing a rather abundant rainfall. Floristically there are no distinct floras corresponding to the topographic divisions, although the southern parts of the region, including the Boston Mountains, have a heavier forest growth richer in types than the northern, and include such southern forms as *Aesculus discolor*, *Tilia floridana*, *Rhamnus caroliniana*, *Ilex decidua*, and *Magnolia acuminata*.

The larger portion of the report is occupied by floristic notes on various sections of the flora and on certain genera and species. The author is convinced that in the region as a whole there is a demonstration of the gradual but actual encroachment of forest upon prairie lands.—GEO. D. FULLER.

Temperature and nodule development.—Using soil temperatures ranging from 12° to as high as 40° C., JONES and TISDALE[14] have studied the effect of these temperatures on the development of nodules by alfalfa, red clover, soy beans, and field peas. The results as to the number of nodules developed were not so very consistent, but when the dry weight of the nodules was determined, it was found that the greatest development, in the case of the soy bean, was at 24° C. This effect of temperature on nodule development is not correlated with a corresponding effect on root and shoot development. It is pointed out in the paper that the real question in a study of this kind is not the effect of temperature on the number of nodules developed by the plants, or on the volume of these nodules, but the effect on the amount of nitrogen fixed in the nodules.

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[12] NILSSON-EHLE, H., Multiple Allelomorphe und Komplexmutationen beim Weizen. Hereditas **1**:277–311. 1920.

[13] PALMER, E. J., The forest flora of the Ozark region. Jour. Arnold Arboretum **2**:216–232. 1921.

[14] JONES, F. R., and TISDALE, W. B., Effect of soil temperature upon the development of nodules on the roots of certain legumes. Jour. Agric. Res. **22**:17–31. *pls. 1–3.* 1921.

Some data in regard to this point are presented. While this is a preliminary paper, the results obtained and the statements as to methods of attack on a problem of this kind are suggestive to workers in this field.—S. V. EATON.

Response of apple trees to nitrogen fertilizers.—Nitrogenous fertilizers have been found by many investigators to cause increased vegetative growth of fruit trees and increased yields of fruit, but the experiments establishing these facts have been largely empirical. A bulletin by HOOKER[15] records the results of experiments planned to get at the chemical changes in the tree resulting from nitrogenous fertilizers. He finds that the spring application of nitrogenous fertilizers causes increased setting of apples, accompanied by an increased nitrogen content of the spurs. In the case of non-bearing trees, increased vegetative growth is caused. Different kinds of quickly available fertilizers had much the same effect. At the time of fruit bud differentiation, the spurs of the spring fertilized trees showed less starch than the spurs of the check trees, so that the spring application of nitrogenous fertilizers would not be expected to favor this process. The accumulation of nitrogen in the spurs just before growth starts in the spring is the greater the later the nitrogenous fertilizers have been applied the preceding season. It is a pleasure to see the horticulturists thus attacking the fundamental problems of their subject.—S. V. EATON.

Vegetation of Illinois.—The recent publication of the 14th annual volume of the Transactions of the State Academy of Science[16] shows about one-third of the volume devoted to reports of botanical and plant ecological studies. The State Forester, R. B. MILLER, discusses some of the undeveloped forest resource, of the southern portion of the state, and in collaboration with GEO. D. FULLER examines in some detail the conditions of tree growth and the forest types existing in a portion of Alexander County. W. G. WATERMAN makes a preliminary report on the bogs of the northern portion of the state, while W. B. MCDOUGALL contributes an interesting key to some forest tree roots. A more extensive investigation is reported by H. DEFOREST, who has studied the woodlands along the Rock River in the northwestern portion of the state. MARY E. RENICH contributes a study of growth as related to size of seed, and A. B. REAGAN has some interesting notes on the plants of the Bois Fort Indian Reservation, Minnesota.—GEO. D. FULLER.

Mosaic disease of tobacco.—PALM[17] has investigated the mosaic disease of tobacco, and has reached the conclusion that it is due to a causal organism.

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[15] HOOKER, H. D., Certain responses of apple trees to nitrogen applications of different kinds and at different seasons. Mo. Agric. Exp. Sta. Res. Bull. 50. 1–18. 1922.

[16] Transactions of the Illinois State Academy of Science. Fourteenth annual meeting. 1921. 14: pp. 326. 1922.

[17] PALM, B. T., Is the mosaic disease of tobacco a chlamydozoonose? English translation by P. G. WILSON. Bull. Deliproefstation Medan-Sumatra. no. 15. pp. 10. 1922.